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APPLICATIONS OF NANOTECHNOLOGY IN THE AGRO-FOOD SECTOR

António A. Vicente

IBB – Institute for Biotechnology and Bioengineering, Centre of Biological Engineering, University of Minho, Campus de Gualtar. 4710-057, Braga, Portugal

Nanotechnology has a great potential to generate innovative solutions, providing food engineers and food technologists with a set of valuable instruments to deal with the growing demands of consumers regarding the foods they eat: safety, quality, health effects and innovation. Nanotechnology is being applied e.g. in the improvement of food safety and in the encapsulation of functional ingredients.

Layer-by-layer technology, which may consist in alternately submerging substrates in aqueous solutions of polyelectrolytes with opposed charges, may be applied to produce multi-layer coatings of nanometric thickness in various surfaces. These coatings may be prepared to incorporate bioactive compounds and promote their controlled release. They may be used to coat food systems, such as fruits and fresh-cut vegetables.

One other nano-system with great potential for application is nanoparticles based in food-grade materials. In this case, it is necessary to study/optimize the formulations and the processing conditions to obtain nanoparticles with the targeted properties. Once again, these systems may be used as carriers of bioactive compounds or as vehicles of such compounds already inside the human body.

It is possible that most of these applications will be difficult to adopt commercially due to their presumably excessive price or by difficulties in scaling-up their production. This just means that there is an enormous room for the development of scientific and technical work around this subject.